2012
Pipeline Performance and Activity Report

BC Oil and Gas Commission

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About the

BC Oil and Gas Commission

The BC Oil and Gas Commission is the provincial regulatory agency with responsibilities for regulating oil and gas activities in British Columbia, including exploration, development, pipeline transportation and reclamation.

The Commission's core services include reviewing and assessing applications for industry activity, consulting with First Nations, cooperating with partner agencies, and ensuring industry complies with provincial legislation and all regulatory requirements. The public interest is protected by ensuring public safety, respecting those affected by oil and gas activities, conserving the environment, and ensuring equitable participation in production.

For general information about the Commission, please visit www.bcogc.ca or phone 250-794-5200.

Mission

We regulate oil and gas activities for the benefit of British Columbians.

We achieve this by:

- Protecting public safety,
- Respecting those affected by oil and gas activities,
- Conserving the environment, and
- Supporting resource development.

Through the active engagement of our stakeholders and partners, we provide fair and timely decisions within our regulatory framework.

We support opportunities for employee growth, recognize individual and group contributions, demonstrate accountability at all levels, and instill pride and confidence in our organization.

We serve with a passion for excellence.

Vision

To be the leading oil and gas regulator in Canada.

Values

Respectful

Accountable

Effective

Efficient

Responsive

Transparent

Purpose of Report

Pipeline Performance and Activity

The oil and gas industry in British Columbia is dependent on pipelines to distribute oil and gas resources. Pipelines are a common mode of distribution and recognized as a safe and economical way to transport oil and gas. The secure operation of these pipelines is essential for public safety and environmental protection.

This report provides a statistical overview of operating, deactivated and abandoned pipelines in British Columbia regulated by the BC Oil and Gas Commission (Commission) in 2012. It includes an inventory on the province's pipelines, data on incident rates and causes, and details on the Integrity Management Program.

The Commission's jurisdiction extends to all pipelines as defined in the Oil and Gas Activities Act (OGAA). It regulates pipeline activities ranging from construction to operation, maintenance, and abandonment.

Pipeline activities are regulated under the Pipeline and Liquefied Natural Gas Facility Regulation (PLNGFR), which states that all pipelines must be operated and maintained in accordance with CSA Z662 – Oil and Gas Pipeline Systems. Other applicable regulations include the Environmental Protection and Management Regulation and Consultation and Notification Regulation.

The Pipeline Permit Application Manual guides applicants through the permit application process and requirements, and the Pipeline Operations Manual details post-approval processes, including mandatory submissions, notifications and amendments. In addition to these manuals, the Commission posts reports and fact sheets on its website at www.bcogc.ca

Pipeline Defined

Pipeline means, except in Section 9 of OGAA, piping through which any of the following is conveyed:

- Petroleum or natural gas.
- Water produced in relation to the production of petroleum or natural gas or conveyed to or from a facility for disposal into a pool or storage reservoir.
- Solids.
- Substances prescribed under Section 133(2)(v) of the Petroleum and Natural Gas Act.
- Other prescribed substances.

The scope of the definition also includes installations and facilities associated with the piping, but does not include:

- Piping used to transmit natural gas at less than 700 kilopascals (kPa) to consumers by a gas utility as defined in the Gas Utility Act.
- A wellhead.
- Anything else that is prescribed.

Pipelines not regulated by the Commission including pipelines crossing provincial and/or federal borders (which are regulated by the National Energy Board) are not addressed in this report.

Pipeline Inventory

The Commission regulates 40,125 kilometres (km) of pipelines in British Columbia that transport a number of refined and unrefined products including natural gas, sour natural gas, crude oil, water, high vapour pressure (HVP) hydrocarbons and other miscellaneous gases and oil effluent.

As Table 1 shows, in 2012 a net addition of 1,102 km of total pipelines were registered with the Commission. The most significant increase was sour gas pipelines. This was mainly due to proponents amending pipelines to flow sour gas and partly due to the installation of new pipelines. The net decrease in the length of natural gas pipelines was due to abandonment of older lines and changes of service to flow sour gas.

The different categories of pipeline operations are defined as follows:

- Operating pipeline: piping actively used for the transport of fluids related to oil and gas operations, and piping that has been suspended from service for less than 18 months, but not formally deactivated or isolated.
- Deactivated pipeline: piping removed from service but is maintained for later return to service.
- Abandoned pipeline: piping removed from service and not maintained for later return to service.

The various pipeline product types encompass the following:

- Sour natural gas includes natural gas with a hydrogen sulphide (H_2S) partial pressure greater than 0.3 per cent.
- Natural gas includes natural gas, sweet gas and fuel gas.
- Crude oil includes crude oil, sour crude and low-vapour pressure hydrocarbons.
- Water includes water, freshwater, produced water, saltwater and sour water.
- High vapour pressure (HVP) includes ethylene, propane, pentanes and liquid ethane.
- Other includes miscellaneous liquids and gases, oil effluent, air and multi-phase lines.

Table 1: Total Length of Pipeline (km) by Product Type and Service

	2012				2011		2010		2009
	Total	Operating	Deactivated	Abandoned	Total	Operating	Total	Operating	Total
Sour Natural Gas	12,708	12,040	442	226	11,910	11,878	12,309	11,952	12,065
Natural Gas	18,125	17,306	333	486	19,159	18,674	19,147	18,717	18,013
Crude Oil	2,019	1,855	84	80	2,412	2,289	2,717	2,603	2,738
Water	2,187	2,039	122	26	2,977	1,575	1,321	1,209	1,186
HVP	265	211	44	10	359	255	230	217	171
Other	4,821	4,585	75	161	2,206	1,640	1,750	1,663	1,695
Total	40,125	38,036	1,100	989	39,023	36,311	37,474	36,361	35,868

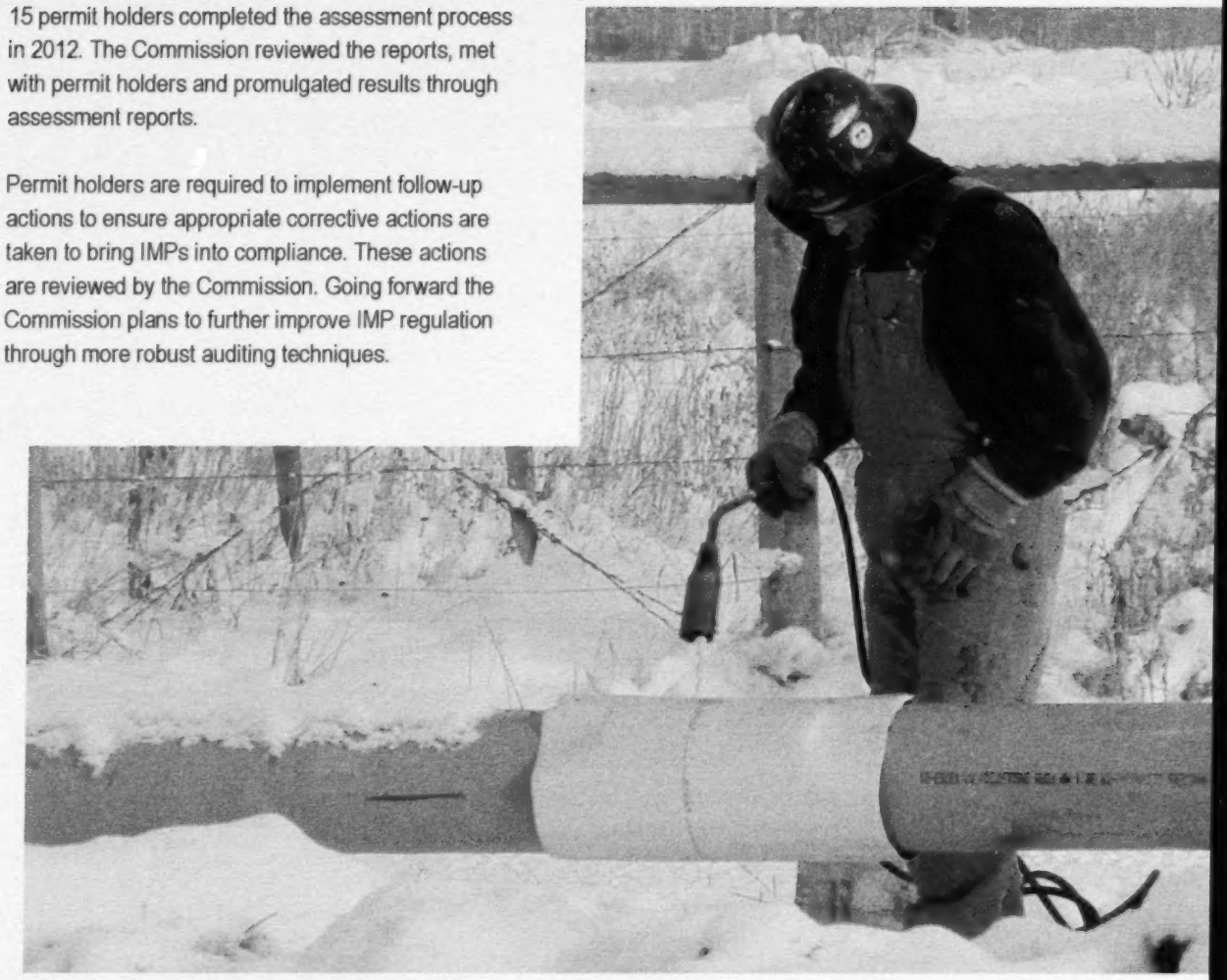
Integrity Management Programs

Pipeline Integrity Management Programs (IMPs) play a key role in ensuring permit holders have proper prevention and mitigation plans to reduce the risk of potential hazards. They ensure pipeline systems are safe for continued service and include procedures to monitor conditions that may lead to failures, as well as eliminate or mitigate such conditions, throughout the entire lifecycle of the pipeline.

As required by the Commission under Section 7 of the Pipeline and Liquefied Natural Gas Facility Regulation, every permit holder designing, constructing, operating, maintaining or abandoning pipeline infrastructure in British Columbia must have a fully developed and implemented IMP. To facilitate compliance, all permit holders must follow the most current version of CSA Z662, including Annex N. CSA Z662 is the standard developed and maintained by the Canadian Standards Association covering the design, construction, operation and maintenance of oil and gas industry pipeline systems that convey liquid hydrocarbons, oilfield water and/or steam, carbon dioxide, or gas. It is a legal requirement for operators to meet this standard for pipelines operating under OGAA in British Columbia.

In 2012, 22 permit holders were requested by the Commission to submit self-assessment reports of their IMPs. Due to name changes or activity status changes 15 permit holders completed the assessment process in 2012. The Commission reviewed the reports, met with permit holders and promulgated results through assessment reports.

Permit holders are required to implement follow-up actions to ensure appropriate corrective actions are taken to bring IMPs into compliance. These actions are reviewed by the Commission. Going forward the Commission plans to further improve IMP regulation through more robust auditing techniques.



Pipeline Requirements

Section 37 of OGAA states that a permit holder and a person carrying out an oil and gas activity must prevent spillage and promptly report to the Commission any damage or malfunction that could cause spillage potentially affecting public safety or the environment.

If spillage occurs, a permit holder or person carrying out an oil and gas activity must promptly do all of the following:

- Remedy the cause or source of the spill.
- Contain and eliminate the spill.
- Remediate any land or body of water affected by the spill.
- Report to the Commission the location and severity of the spill and any contributing damage or malfunction if the spillage is a risk to public safety or the environment.

A person who is aware that spillage is occurring, or is likely to occur, must make reasonable efforts to prevent or assist in containing or preventing the spillage.

The Commission has a 24/7 emergency telephone line to respond to incidents such as spills. Depending on the level of the incident, the Commission may respond with trained personnel to ensure any risk to the public and environment is mitigated.

Section 38 of OGAA contains a provision whereby a permit holder must prepare and maintain an Emergency Response program and a response contingency plan, which must be updated annually and be approved by the Commission. The Commission regularly audits the effectiveness of these programs to ensure they adequately respond to the hazards identified, and may also oversee emergency exercises. Failure to satisfactorily meet these requirements can result in compliance and enforcement actions.

Incidents

Incident reporting must occur regardless of the status of the pipeline or the type of product released. Even incidents in which there is the potential for release of product, but no release, must be reported. All reported incidents are assessed by the Commission to determine what remedial actions must be taken and whether the pipeline can continue to operate. If required, the Commission will issue orders for remedial actions to the permit holder. The Commission also conducts investigations to determine cause and contributing factors to identify any remedial actions and repairs that must be made in order to prevent a recurrence. The permit holder must submit a post-incident report to the Commission, which summarizes the root cause of the incident, repair methods, operational changes and design changes that may be required. Based on the results of these investigations, the Commission may issue recommendations and/or directives.

In 2012, there were 27 pipeline incidents reported to the Commission, as shown in Figure 1. The leading known cause of failure was corrosion as per Table 2. The overall incident frequency for 2012 was 0.67 for every 1,000 km of pipeline, a decrease compared to 0.87 in 2011 and 1.38 in 2010. Crude oil pipelines had the highest incident frequency of 2.97 while water lines had 2.74. Pipelines carrying water had the highest incident frequency in 2011 with an incident rate of 2.69 per 1,000 km and in 2010 with a rate of 4.96 per 1,000 km.

Table 2 shows the frequency of pipeline incidents under the Commission's jurisdiction per 1,000 km of pipelines. The implementation of OGAA in 2010 led to broader reporting criteria. Prior to 2010 only incidents causing a release were reported, but now under the current regulations, all incidents that have the potential to affect the integrity of a pipeline must be reported.

Metal loss or corrosion was the leading cause of failure contributing to 12 incidents and external corrosion was the leading form of corrosion with six incidents. Equipment failure accounted for 22 per cent of all pipeline incidents in 2012, or six incidents overall, as illustrated in Table 3 (next page).

Figure 2 on Page 10 shows incidents in relation to pipeline type for 2012. These reflect overall numbers, and are not weighted to reflect length of pipeline. Metal loss was the major cause of failure for all types of pipelines except for crude oil.

Figure 1: 2012 Pipeline Incidents by Product

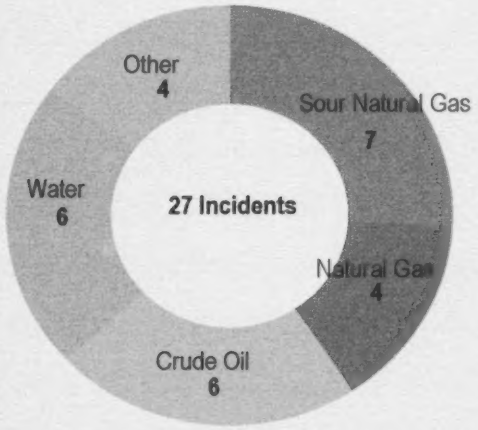


Table 2: Total number of incidents per 1,000 km of pipeline inventory

	2012	2011	2010	2009
Length of Pipelines (km)	40,125	39,023	36,361	35,868
Number of Incidents	27	34	50	37
Incident Frequency (Incidents/1,000 km)	0.67	0.87	1.38	1.03

Type of Pipeline	2012 Length of Pipeline (km)	# of Incidents	Frequency (per 1,000km)
Sour Natural Gas	12,708	7	0.55
Natural Gas	18,125	4	0.22
Crude Oil	2,019	6	2.97
Water	2,187	6	2.74
HVP	265	0	0.00
Other	4,821	4	0.83

Table 3: Classification of Pipeline Failures

Incident Cause	Definition	2012	2011	2010	2009
Metal Loss	Wall thickness reduction due, for example but not exclusively, to corrosion				
Internal Corrosion	Loss from internal surface of pipe body or weld due, for example to corrosion or erosion	5	10	14	15
External Corrosion	Loss from external surface of pipe body or weld due, for example to corrosion or erosion	6	5	2	1
Suspected Corrosion	Most likely due to corrosion although internal/external corrosion has not been confirmed	1	2	4	1
Total Metal Loss		12	17	20	17
Pipeline/Equipment Failure					
Cracking in Pipe	Mechanically driven or environmentally assisted cracking of the pipe	1	0	0	0
Pipe Fittings / Joint Failure	Failure in valve, weld, flange, etc.	4	6	2	1
Miscellaneous Equipment	Failure in the tank, compressor, site seeing glass, etc.	1	0	9	2
Total Cracking		6	6	11	3
External Interference	External activities causing damage to pipe				
Third Party Interference	Interference by someone other than operating company or its employees/contractors	2	1	5	0
Company	Interference by operating company or its employees/contractors	1	5	2	3
Vandalism	Interference caused willfully by someone through attempted theft of service fluid	0	0	0	1
Total External Interference		3	6	7	4
Material Manufacturing or Construction	Defects in the fitting, construction or components	0	2	1	3
Geotechnical Failure	Loss of integrity due to geotechnical effect, for example, slope movement or weather	4	2	3	3
Other Causes	Other causes not included in previous definitions				
Improper Operation	Decision error made by operating company during service	2	1	8	7
Overpressure	Failure caused due to overpressure of pipe	0	0	0	0
Total Other Causes		2	1	8	7
TOTAL INCIDENTS		**27**	**34**	**50**	**37**

Figure 2: 2012 Incident Cause by Pipeline Type

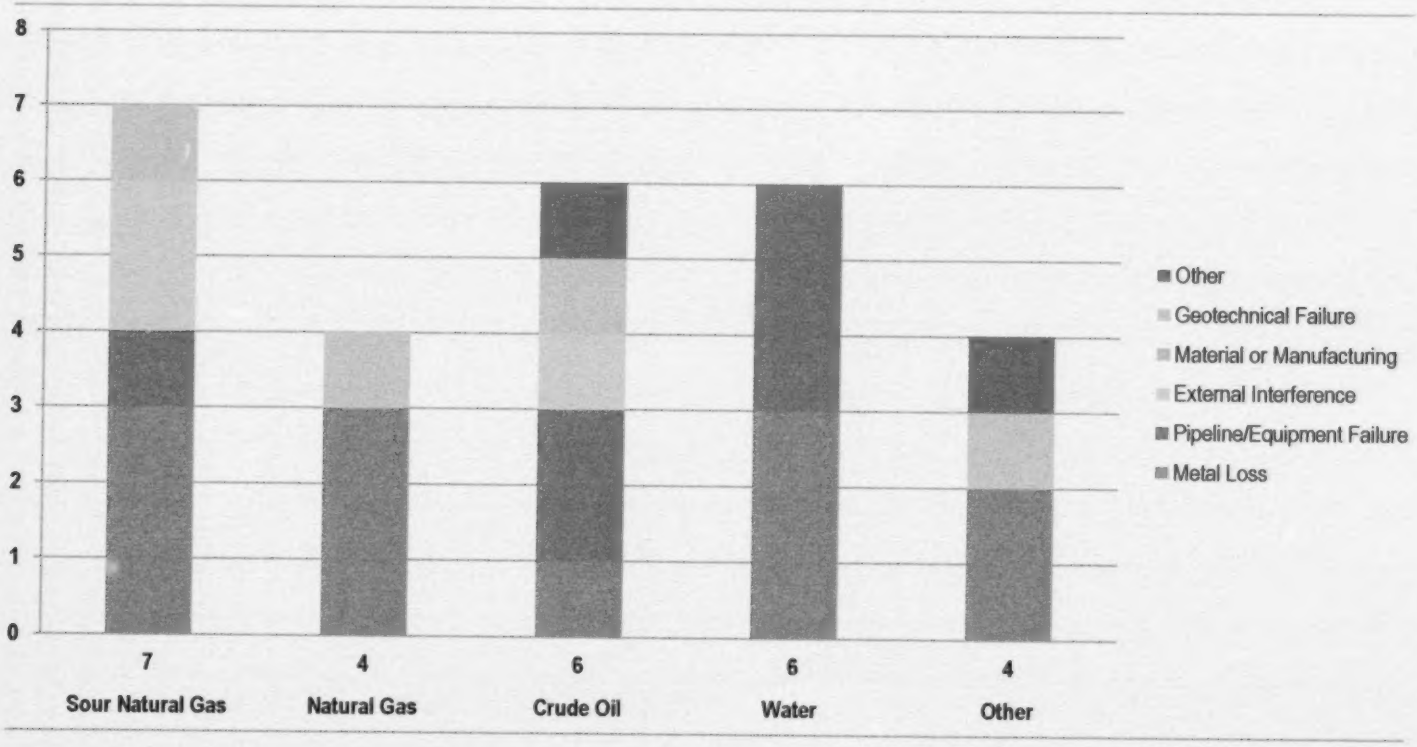


Table 4: Liquid Volume Released by Product in 2012

Spill Liquid	Volume (m^3)
Crude Oil	4.02
Produced Water	51.6
Other	9.9

Table 5: Gas Release Volume by Product in 2012

Spill Gas	Volume (m^3)
Sour Natural Gas	7,006
Natural Gas	29,200

Product Releases

In 2012, the largest reported liquid release was 32 cubic metres (m^3) of produced water. The spill is suspected to have been caused by corrosion cracking of the pipe at the injection facility. The "other" liquids spilled include methanol, emulsion and condensate.

There was one major reported gas release in 2012 where 28,000 m^3 of sweet natural gas was released. This incident was due to equipment failure. The area was inaccessible at the time of occurrence, so the line was depressurized and shut off and was repaired at a later date.

Tables 4 and 5 show the total volume of releases in 2012 by product type.

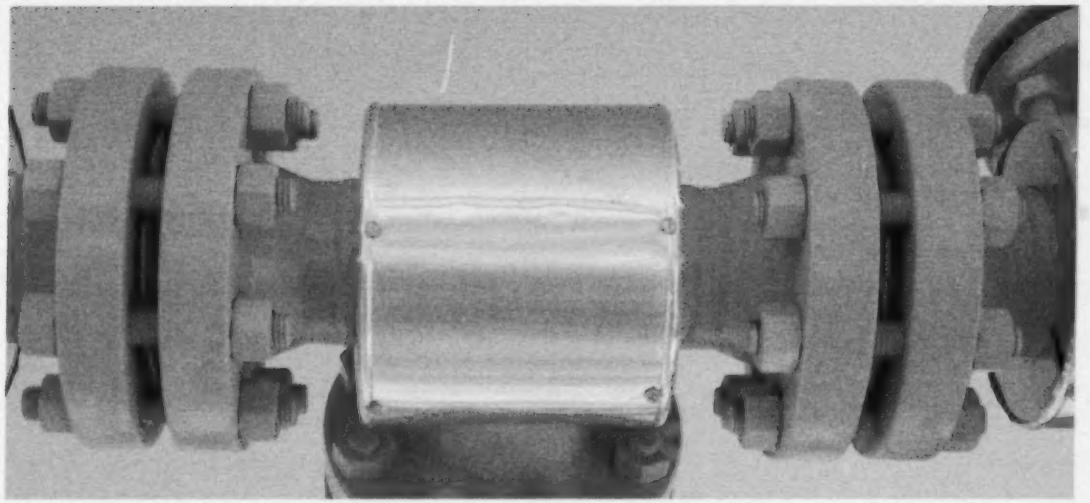
Permit holders are required to respond to all incidents appropriately and effectively. The Commission ensures that any product released as the result of a pipeline incident is fully remediated, and any problems fixed before operations resume.

Moving Forward

The Commission continues to improve pipeline regulations through IMPs, ongoing communication and with new initiatives due to increased Liquefied Natural Gas (LNG) interest. LNG-related pipelines will be regulated by the Commission under the Oil and Gas Activities Act and Pipeline and Liquefied Natural Gas Facility Regulation. They will be subject to the same regulatory processes, such as the compliance and enforcement, inspections and emergency response planning.

Specific initiatives by the Commission include:

- IMPs continue to improve the design, construction, operation and maintenance of existing pipelines, including older, legacy pipes that may not be constructed to the same standards of today.
- Land Owner's Information Guide was recently updated and provides relevant information in regards to right of ways, and land owner requirements for contacting BC One Call prior to conducting ground activities near a pipeline.
- A Pipeline Corridor Analysis is being developed by the Commission to enable consistent and credible impact assessment of multiple proposed or potential pipeline route options in respect to increased LNG activity.



More Information

Contact www.bcogc.ca

This report is updated as required. For specific questions or enquiries regarding this report, please contact:

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